APPENDIX D-24

D-24 Detailed test procedures for Sub-Test II-24 Common Data Channel (CDC), Centralized Administration Facilities (CAF), Centralized Maintenance Facilities (CMF), Network Management Facility (NMF) and Centralized Attendant Services (CAS) (There are no GSCR requirements for this subtest, however, these test procedures will be tested on switches that have a requirement to interface to the DSN Europe KSN(S) 4100 switches).

Use GL Communications analyzers to monitor CDC links and CAS trunks for dialed digits and circuit activity.

Use Ameritec traffic loader to generate background traffic that will cause Automatic Message Accounting action at KNA and KNB. Use a T1 and create a load scenario with two-way traffic.

This sub test is composed of eight different combinations of T1 and E1 links requiring that each combination be tested individually as defined by Table 15 in paragraph II-24.4 using the procedures in paragraphs D-24.2 through D-24.4 that follow.

D-24.1 General Information

In a network of KN-S-4100 switches, messages can be produced by software which can be routed to various output media. One of these media is the CDC where these messages can be transported defined destinations.

The CDC can service four common, centralized services. They are CAF, CMF, NMF, and CAS. In the KN-S-4100 network, a MASTER is designated for centralized service with a maximum of 254 slaves (served systems). Each can be considered a separate network connected via CDC links. In the CAS network an alternate MASTER is allowed.

In a CDC environment each KN-S-4100 must be provided a code number and a system name. Since the switch under test will not be a KN-S_4100, this requirement cannot be met and it will be necessary to allow routing of CDC links and CAS trunks transparently.

Setup of the transmission paths for centralized services are automatic once the configurations have been made. The Route Access Code (RAC) in the KN-S-4100 is required and consists of two parts, the feature code of the central services and the code number of the destination system.

The transmission paths for CDC may be permanent (point-to-point) or setup on demand. Normally, the CDC links are established in the permanent mode. These test procedures address permanent mode only since it can be assumed on demand service would require the same link initialization procedures.

The data transmitted into the CDC channels are subdivided into two groups. Group 1 consists of messages transmitted on behalf of CAF, CMF, and NMF. Certain messages can be only sent to CAF or NMF, and others only to CMF. Some messages can only be sent to CAF, CMF, or NMF but not simultaneously. Group 2 consists of messages for the CAS. Two different transmission paths are required for this function. The data exchange for the switching function takes place using the CDC. A separate Voice Frequency (VF) trunk is required for the transmission of speech.

CAF

Centralized database administration is made possible by the CAF. One or several administration centers may be created, depending on the size of the network. Access to remotely controlled systems takes place using specific system identifications and password controls. The procedures and commands are identical at the local and remote switch. The CAF has three primary tasks of which database administration and automatic message accounting will be tested:

Database Administration

Traffic Data Recording

Automatic Message Accounting

CMF

CMF provides centralized maintenance service within a network of KN-S-4100 switches connected together by CDC links. Access to remote switches is controlled by specific system identifications and passwords. Alarm messages generated at a specific switch will be sent to the controlling CMF switch automatically. However, the capability exists using database administration commands to limit the types of alarms forwarded. Maintenance and diagnostic programs can be remotely activated using CMF.

NMF

Network Management Control (NMC) provides the capability to restrict, reroute, and normalize trunk traffic in a network. This capability is dependent on various criteria, such as overloading. The NMC commands activate or deactivate pre-established plans configured for the network and activated on a switch (or switches). NMC commands can also be used

individually to make immediate changes to some parameters, such as the directionalization of traffic. Procedures in this plan will only use NMC commands affecting directionalization of trunks. This will demonstrate that the KN-S-4100 configurations support NMF by allowing the user to change a directionalization parameter on a served switch.

CAS

CAS will provide attendant service to switches without attendant consoles and will allow service to be changed between switches with attendant consoles. Because the CAS for the KN-S-4100 switches was designed when there were no standards for such service, ISDN protocol elements were implemented to handle the functions. Therefore, only the KN-S-4100 switches can operate efficiently using the service. It is possible for outside parties to access attendants but there will be significant limitations. The following service modes are available and are listed in order of priority. Of the four the first three will be tested.

Local Attendant

Primary CAS

Alternate CAS

Night Service

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Important KN-S-4100 Commands and Options

CSNA This command provides the means to administer the information for a centralized services network of served and serving systems. This command assigns the service.

COPT (Command Options)(Only initialization options are shown)

INSAM initiates the three characters of the system name with the associated system numbers of all systems in the network (SNUM, SNAM)

INHOME initiates the serving system name, the alternate serving system name, and the served name of the CAS. (SVGS, ALTS,SVDS)

INCAS initiates the serving system and served system of CAS (SVGS, SVDS)

INCAF initiates the serving system and served system of CAF (SVGS, SVDS)

INCMF initiates the serving system and served system of CMF (SVGS, SVDS)

INNMF initiates the serving system and served system of NMF (SVGS, SVDS)

MOSVDS adds the served system name for a specified servid3e to the list of served systems(SERV, SVDS)

SNUM (System Number)
Enter the number of the switch in the network. This number is also used by other database elements.

SVGS (Serving System)
Enter the name of the serving switch

SVDS (Served System)
Enter the name of the served switch.

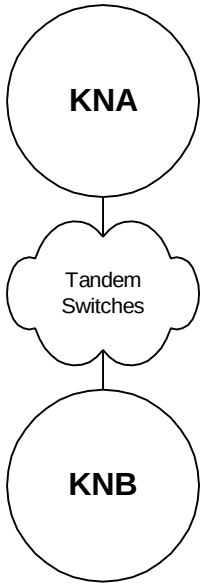
ALTS (Alternate System)
Enter the name of the alternate serving system for CAS

SNAM (System Name)
Enter the name of the system in the network

CHRT (Switch Characteristics)

SERV (Centralized Service)

CMF = Centralized Maintenance
CAF = Centralized Administration
CAS = Centralized Attendant
NMF = Network Management



INHOME = KNA
SVGS = KNA
SVDS = KNB

INHOME = KNB
SVGS = KNA
SVDS = KNB

CLNK This command provides the means to administer the characteristics of a physical CDC-Link between two adjacent switches. For the purpose of this test, the two adjacent switches will be KN-S_4100s with their CDC links that tandem through the switch under test.

COPT (Command Options)
INCLINK allow initiation of the link between two systems MODTYP allows modifications

CLNK (CDC-Link)
Used to enter the name of the link destination as assigned by ADM CSNA

PREF (Preference)
Used to enter link preference to address the primary or alternate transmission types

CS (Configuration Status)
Status can be PREA or ASSN

MSTR (Master)
Defines a system as a master or slave for this link

DMDO (Demand Only)
Defines if this link is permanent or demand only.

TTYP (Transmission Type)
Defines one of the following types. Only T1 and E1 will be used in testing)
D64 = digital 64Kbps PCM 30
D56 = digital 56Kbps PCM 24
4A9.6 = 4-wire analog 9600 bps
4A4.8 = 4-wire analog 4800 bps
4A2.4 = 4-wire analog 2400 bps
4A2.4 = 2-wire analog 2400 bps

CRTE This command provides the means to administer a CDC route and its characteristics. The CRTE defines the route from the origination to the destination system.

COPT (Command Option)
INCRTE initiate a CDC route between tow systems

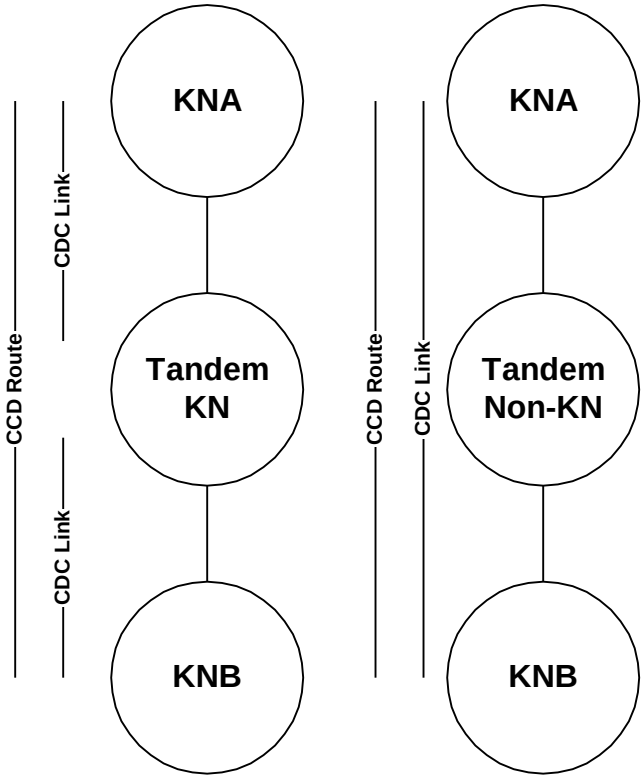
CRTE (CDC Route Destination)
Enter the system name of the CDC route destination as assigned in ADM CSNA

CS (Configuration Status)
May be **PREA** or **ASSN**

ASWT (Adjacent Switch)
Enter the system name of the adjacent switch as assigned in ADM CSNA

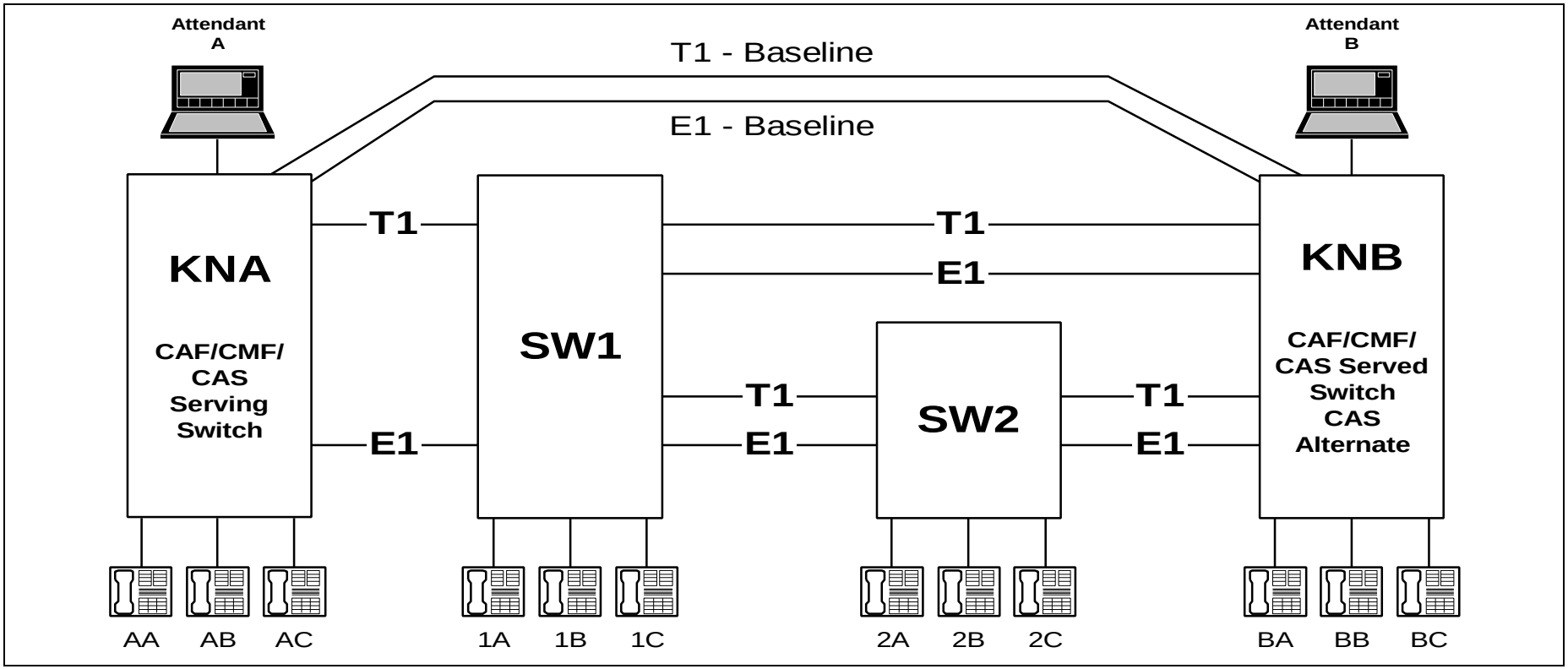
DMDO (Demand Only)
Defines the CDC route as permanent or demand only.

TAND (Tandem Route)
Enter Yes if the route is tandem or No if the route is not. For the purpose of this test, the switch under test is transparent and should not be considered part of a tandem CDC route. This is because the switch under test will be interpreting CDC messages.



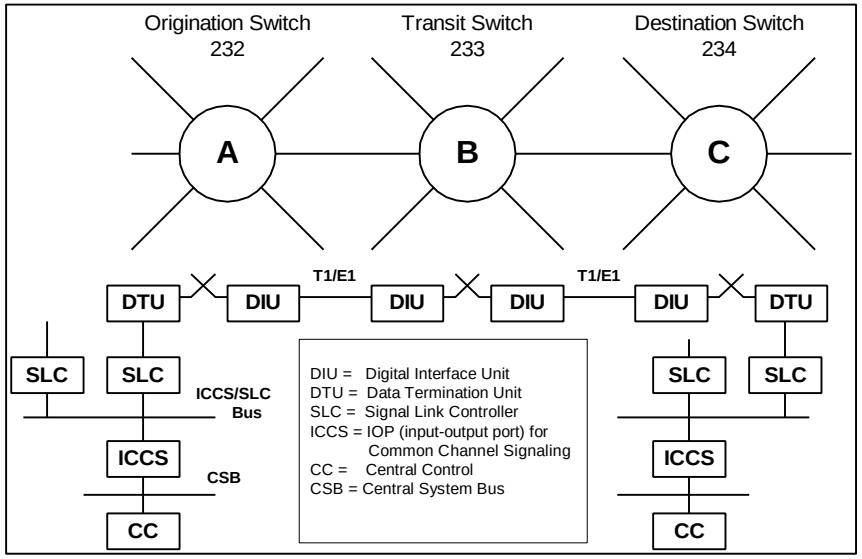
D-24.2 General Configuration

Consult the figure on page 24.5. The Attendant Console on KNA will be assigned as the primary CAS with the console on KNB set as the alternate. The CDC links between KNA and KNB will be configured so that KNA is the SERVING and KNB is the SERVED switch. Before starting the test, configure and verify operation over T1 then E1 facilities between directly connected KN-S-4100 switches. This must be done to show that everything is normal and operational before the test switches are connected.

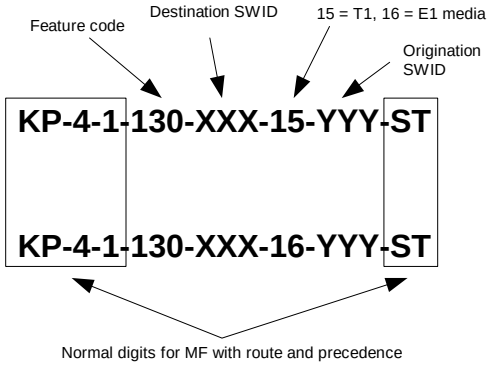


Routing

The KNS-4100 uses an older version of Integrated Services Digital Network (ISDN) protocols between switches connected by CDC links. Q.920 and Q.921 Link Access Procedures on the D-Channel (LAP D) protocols are used at Layer 2. Q.930 User-Network Interface (UNI) protocol is used at Layer 3. The way the KN-S-4100 makes the connections between peer protocols in connected KN-S-4100 switches is through the use of feature codes and 3-digit switch identification numbers at the time CDC links are established. The KN-S-4100 translates the digits and makes the appropriate hardware and software connections over the CDC link. The figure to the right illustrates these connections.



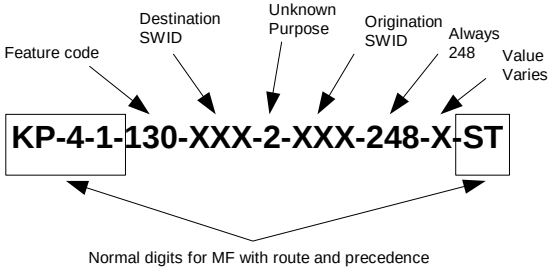
CDC Numbering



These are the digits that a KN-S-4100 dials when establishing a CDC link. Not counting the KP, ST, precedence and route digits, there are 11 additional digits that need to be passed. A switch that cannot accept a first digit of '1 'will force a translation to be configured in the KN-S-4100 switches. For example, the 130 could be converted to 92. This would result in an outgoing digit stream of KP-4-1-92-XXX-15-XXX-ST. The switch should select a route based on 92-X and send all the remaining digits. The terminating KN-S-4100 would require reverse translations to get back to the original number. It is imperative that the resulting digits at the destination KN-S-4100 be correct. If the feature code or switch identifications (SWID) are incorrect, the KN-S-4100 will not be able to properly handle CDC messages.

CAS Numbering

CAS numbering is a little different and a bit more problematic. The first digit is still a '1 'but now there are 14 digits to dial. 18 if the KP, ST, precedence, and route digits are counted. If the switch will not process a first digit of '1 ' or cannot handle 14 digits, the KN-S-4100 will require a special translation for each combination of 130-XXX.



D-24.2 Common Data Channel (CDC) (Criteria II-24.2.a) This test will verify that the CDC channel can be established and maintained.

<table>
<tr><td colspan="3">Configure the T1 or E1 media between the switches. T1 should be AMI, D4. E1 should be HDB3, G704MF. Three separate T1 trunk groups (KN-S-4100 only) for CDC will be assigned using trunk type numbers (TNUM) 55, 56, and 56. TNUM 76 will be used on E1 trunk groups.</td></tr>
<tr><td colspan="3">Configure the routing in the KN-S-4100 switches and the switch under test.</td></tr>
<tr><td colspan="3">Attach test equipment to monitor links between KN-S-4100 switches.</td></tr>
<tr><td>Configure the CDC CLNK and CRTE between the SERVED and SERVING KN-S-4100 switches.</td><td>Did the CDC link automatically establish itself?
Y/N</td><td>Comments:</td></tr>
<tr><td colspan="3">Non-preemption Verification</td></tr>
<tr><td colspan="3">At KNA, busy out all but three trunks between KNA and the switch under test.</td></tr>
<tr><td colspan="3">If the CDC link was disrupted during the process of busying trunks, ensure that the link is automatically restored.</td></tr>
<tr><td>From subscriber BA, place a FLASH OVERRIDE call to subscriber AA . Both parties off hook</td><td>Verify that two trunks are busy and one trunk is idle.
Y/N</td><td rowspan="3">Comments:</td></tr>
<tr><td>From Subscriber AB, place a FLASH OVERRIDE call to subscriber BB. Both parties off hook</td><td>Verify that three trunks are busy and no idle trunks are available..
Y/N</td></tr>
<tr><td>From subscriber BC, place a FLASH OVERRIDE call to subscriber AC.
Monitor the three busy trunks using test equipment.</td><td>Verify that the CDC link was not preempted
Y/N
Verify that the first two FLASH calls are still in talk state.
Y/N</td></tr>
<tr><td colspan="3">Throughout the test periodically verify that the CDC link remains active</td></tr>
</table>

D-24.3 Centralized Administrative Facilities (CAF) (Criteria II-24.2.b) This test will verify the transparency of the switch to centralized administration commands issues across the CDC link.

Ensure that the KNA is configured to allow remote administrative functions coming from KNB.		
Remotely login to KNA from KNB	Remote login successful. Y/N	Comments:
Enter the command DISPCLNK	The CLNK configuration for KNA is displayed. Y/N	
Enter the command DISPCRTE	The CLNK configuration for KNA is displayed. Y/N	
Terminate the remote session	The session is terminated Y/N	

D-24.4 Centralized Maintenance Facilities (CMF) (Criteria II-24.2.c) This test will verify the transparency of the switch to centralized maintenance commands issued across the CDC link.

Ensure that the KNA is configured to send DEP-reports and ALM-reports to KNB		
Remotely login to KNA from KNB	Remote login successful. Y/N	Comments:
Enter the command STATCLNK	The CLNK status for KNA is displayed. Y/N	
Enter the command STATCRTE	The CLNK status for KNA is displayed. Y/N	
Terminate the remote session	The session is terminated Y/N	
At KNA, create an alarm by removing the input signal to one of the T1 or E1 links. Make sure that the link carrying the CDC link is not selected for this operation.	An alarm is generated by KNA and seen at KNB shortly after the link is broken. Y/N	
Restore the link by reconnecting the input signal.	KNA restored the link to service. Y/N The alarm is removed by KNA and seen at KNB shortly after the link is restored. Y/N	

D-24.4 Centralized Attendant Services (CAS) (Criteria II-24.2.d) This test will verify the transparency of the switch to centralized attendant services between two KN-S-4100 switches.

Ensure that KNA is configured as the primary provider of centralized attendant service for KNA and KNB		
Ensure that KNB is configured as the secondary provider of centralized attendant service for KNA and KNB		
Ensure that KNA and KNB attendant consoles are on-line with the handsets connected.		
Primary Attendant Access by dialing the Operator using 0 '		
From subscriber AA go off hook and dial 0 'for the attendant	Verify that the attendant at KNA indicates an incoming call	Comments:
Answer the call by pressing the FROM-IN key at the attendant console.	Verify that a talk path has been established Y/N Verify that the attendant console displays the callers number and class-of-service Y/N	
Go on hook at the attendant console and at the subscriber	Verify that the attendant console display is extinguished Y/N	
From subscriber BA go off hook and dial 0 '	Verify that the attendant at KNA indicates an incoming call Y/N	
Answer the call by pressing the FROM-IN key at the attendant console.	Verify that a talk path has been established Y/N Verify that the attendant console displays the callers number and class-of-service Y/N	
Go on hook at the attendant console and at the subscriber	Verify that the attendant console display is extinguished Y/N	

D-24.4 Centralized Attendant Services (CAS) (Continued)

Primary Attendant access by dialing Information Attendant using '113'		
From subscriber AA go off hook and dial '113' for the attendant	Verify that the attendant at KNA indicates an incoming call Y/N	Comments:
Answer the call by pressing the FROM-IN key at the attendant console.	Verify that a talk path has been established Y/N Verify that the attendant console displays the callers number, class-of-service and indicates the call is an Information call Y/N	
Go on hook at the attendant console and at the subscriber	Verify that the attendant console display is extinguished Y/N	
From subscriber BA go off hook and dial '113' for the Information attendant	Verify that the attendant at KNA indicates an incoming call Y/N	
Answer the call by pressing the FROM-IN key at the attendant console.	Verify that a talk path has been established Y/N Verify that the attendant console displays the callers number, class-of-service, and that the call is an Information call. Y/N	
Go on hook at the attendant console and at the subscriber	Verify that the attendant console display is extinguished Y/N	

D-24.4 Centralized Attendant Services (CAS) (Continued)

Primary Attendant access by dialing the Long Distance Attendant using '112'		
From subscriber AA go off hook and dial '112' for the Long Distance attendant	Verify that the attendant at KNA indicates an incoming call Y/N	Comments:
Answer the call by pressing the FROM-IN key at the attendant console.	Verify that a talk path has been established Y/N Verify that the attendant console displays the callers number and class-of-service and indicates the call is an Information call Y/N	
Go on hook at the attendant console and at the subscriber	Verify that the attendant console display is extinguished Y/N	
From subscriber BA, go off hook and dial '112' for the Long Distance attendant.	Verify that the attendant at KNA indicates an incoming call Y/N	
Answer the call by pressing the FROM-IN key at the attendant console.	Verify that a talk path has been established Y/N Verify that the attendant console displays the callers number, class-of-service, and that the call is for long distance service. Y/N	
Go on hook at the attendant console and at the subscriber	Verify that the attendant console display is extinguished Y/N	
CAS Queuing - Primary Attendant		
From subscriber AA dial the attendant using '0' at ROUTINE	Verify that the call is signaled at the attendant on KNA, but do not answer the call. Y/N	Comments:
From subscriber AB dial the attendant using '0' at PRIORITY	Verify that the call is signaled at the attendant on the precedence queue, but do not answer the call. Y/N	
From subscriber BA dial the attendant using '0' at IMMEDIATE	Do not answer!	

D-24.4 Centralized Attendant Services (CAS) (Continued)

CAS Queuing - Primary Attendant (continued)		
From subscriber BB dial the attendant using 0 ’at FLASH	Do not answer! Verify that all callers can hear ring back tone. Y/N	Comments:
Using the FROM-IN key at the attendant console on KNA, answer all of the calls in the queue	Verify that the calls are answered in the following order: BB FLASH Y/N BA IMMEDIATE Y/N AB PRIORITY Y/N AA ROUTINE Y/N	
At the attendant console on KNA disconnect the handset to force CAS to the secondary attendant on KNA		
Secondary Attendant Access by dialing the Operator using 0 ’		
From subscriber AA go off hook and dial 0 ’for the attendant	Verify that the attendant at KNB indicates an incoming call Y/N	Comments:
Answer the call by pressing the FROM-IN key at the attendant console.	Verify that a talk path has been established Y/N Verify that the attendant console displays the callers number and class-of-service Y/N	
Go on hook at the attendant console and at the subscriber	Verify that the attendant console display is extinguished Y/N	
From subscriber BA go off hook and dial 0 ’	Verify that the attendant at KNB indicates an incoming call Y/N	
Answer the call by pressing the FROM-IN key at the attendant console.	Verify that a talk path has been established Y/N Verify that the attendant console displays the callers number and class-of-service Y/N	
Go on hook at the attendant console and at the subscriber	Verify that the attendant console display is extinguished Y/N	

D-24.4 Centralized Attendant Services (CAS) (Continued)

Secondary Attendant access by dialing Information Attendant using '113'		
From subscriber AA go off hook and dial '113' for the attendant	Verify that the attendant at KNB indicates an incoming call Y/N	Comments:
Answer the call by pressing the FROM-IN key at the attendant console.	Verify that a talk path has been established Y/N Verify that the attendant console displays the callers number, class-of-service and indicates the call is an Information call Y/N	
Go on hook at the attendant console and at the subscriber	Verify that the attendant console display is extinguished Y/N	
From subscriber BA go off hook and dial '113' for the Information attendant	Verify that the attendant at KNB indicates an incoming call Y/N	
Answer the call by pressing the FROM-IN key at the attendant console.	Verify that a talk path has been established Y/N Verify that the attendant console displays the callers number, class-of-service, and that the call is an Information call. Y/N	
Go on hook at the attendant console and at the subscriber	Verify that the attendant console display is extinguished Y/N	
Secondary Attendant access by dialing the Long Distance Attendant using '112'		
From subscriber AA go off hook and dial '112' for the Long Distance attendant	Verify that the attendant at KNB indicates an incoming call Y/N	Comments:
Answer the call by pressing the FROM-IN key at the attendant console.	Verify that a talk path has been established Y/N Verify that the attendant console displays the callers number and class-of-service and indicates the call is an Information call Y/N	
Go on hook at the attendant console and at the subscriber	Verify that the attendant console display is extinguished Y/N	

D-24.4 Centralized Attendant Services (CAS) (Continued)

From subscriber BA, go off hook and dial '112 ' for the Long Distance attendant.	Verify that the attendant at KNB indicates an incoming call Y/N	Comments:
Answer the call by pressing the FROM-IN key at the attendant console.	Verify that a talk path has been established Y/N Verify that the attendant console displays the callers number, class-of-service, and that the call is for long distance service. Y/N	
Go on hook at the attendant console and at the subscriber	Verify that the attendant console display is extinguished Y/N	
CAS Queuing - Secondary Attendant		
From subscriber AA dial the attendant using 0 ' at ROUTINE	Verify that the call is signaled at the attendant on KNB, but do not answer the call. Y/N	Comments:
From subscriber AB dial the attendant using 0 ' at PRIORITY	Verify that the call is signaled at the attendant on the precedence queue at KNB, but do not answer the call. Y/N	
From subscriber BA dial the attendant using 0 ' at IMMEDIATE	Do not answer!	
From subscriber BB dial the attendant using 0 ' at FLASH	Verify that all callers can hear ring back tone. Y/N	
Using the FROM-IN key at the attendant console on KNA, answer all of the calls in the queue	Verify that the calls are answered in the following order: BB FLASH Y/N BA IMMEDIATE Y/N AB PRIORITY Y/N AA ROUTINE Y/N	
At the KNA, reconnect the attendant handset to cause CAS to return to KNA		
From subscriber BA call the attendant by dialing 0 '	Verify that the call is signaled at the attendant console on KNA. Y/N	Comments:
Answer the call by pressing the FROM-IN key on the attendant console at KNA Go on hook at subscriber BA and the attendant	Verify that the subscriber BA is connected to the attendant and that the subscribers number and class-of-service are displayed. Y/N	

D-24.4 Centralized Attendant Services (CAS) (Continued)

CAS Trunk Non-preemption Verification		
At KNA, busy out all but three trunks between KNA and the switch under test.		
If the CDC link was disrupted during the process of busying trunks, ensure that the link is automatically restored.		
From subscriber 1A, place a FLASH OVERRIDE call to subscriber AB. Answer the call.	Verify that two trunks are busy and that one trunk is idle. Y/N	Comments:
From subscriber BA, place a FLASH OVERRIDE call to subscriber BA. Answer the call.	Verify that all three trunks are busy. Y/N	
From subscriber BB, place a FLASH call to the attendant by dialing 91 + 0	Verify that subscriber BB is receiving ring back tone Y/N	
Quickly, place two more calls to the attendant from subscribers 1B and BC at ROUTINE precedence by dialing 0 '	Verify that all calls to the attendant are receiving ring back tone. Y/N	
Go on hook with subscribers 1A and AB	Verify that the trunk becomes idle Y/N Verify that the idled trunk is seized and that the attendant console on KNA is signaled that three calls are queued Y/N	
At the attendant console on KNA, press the FROM-IN key to answer the first call in the queue	Verify the talk path between the attendant and subscriber BB at FLASH Y/N Verify that subscribers IB and BC are still receiving ring back tone. Y/N	
From subscriber 1C, place a FLASH OVERRIDE call to subscriber AC	Verify that the call does not preempt any of the following: CDC link Y/N CAS trunk Y/N Existing FLASH OVERRIDE call Y/N	
From the attendant console, continue to answer all queued calls.	Verify that all calls are still in the queue and can be connected to the attendant. Y/N	
Go on hook with all calls		
Repeat these procedures for all trunk and TNUM combinations		